

REMARKS

Claims 7-45 are pending in the above-identified application. The Examiner has rejected claims 1-9, 11-17, 23-25, 28, 29, 32-39, and 41-45 and has objected to claims 10, 18-22, 26, 27, 30, 31, and 40.

Discussion of the Examiner's Comments¹

The Examiner raised the same rejections presented in the present Office Action in the Final Office Action dated January 4, 2007. These rejections were addressed in the Amendment filed on February 21, 2007, and eventually entered on May 4, 2007, with the filing of a Request for Continued Examination. The Examiner, however, has now opined that the reference McHale inherently teaches that the signals are demodulated synchronously. Applicant disagrees with this assertion.

As stated in MPEP 2112, “[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art.” *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner, however, has opined that “[s]ince the combined signal carries data on frequencies, F_1 - f_N as cited above, and each demodulator receives the combined signal to recover an assigned frequency, the demodulators would have to recover the data synchronously, if not the recovered data would be inaccurate and erroneous.” Applicant disagrees with this assertion. In fact, the Examiner’s reasoning is akin to opining that all digital FM radio stations must broadcast synchronously because that is necessary for the individual digital receivers to obtain correct

¹ The Examiner has characterized several aspects of the claims and the prior art references. Applicants should not be deemed to agree or acquiesce in these characterizations in any way, even if those characterizations are not specifically addressed in this response.

digital data, which is clearly untrue. Further, if the Examiner persists in this rejection, Applicant requests that the Examiner provide further technical reasoning as to why synchronous data is inherent in the teachings of McHale.

McHale, in essence, teaches a switch for switching subscriber lines to a limited number of modems. As is shown in Figure 13A, which is referred to by the Examiner, each one of N data lines 54, each data line corresponding to a subscriber line, provides data to a Frequency Agile modulator 638, which modulates the data from that particular subscriber with a unique one of N frequencies f_1 - f_N . The signals from all of the modulators are mixed in a mixer 642 and provided to M demodulators 644. Each of the demodulators 644 is programmed by a controller 636 to demodulate the incoming signal from the mixer 642 at one of the N frequencies f_1 through f_N . The digital data received in each of the M demodulators 644 is then output to its corresponding xDSL modem 648. Each of the demodulators 644, then, receives data from one of the N subscriber lines. As stated in the specification, “[b]y designating the appropriate frequency, controller 636 effectively connects an assigned a modem 648 to a data line 54.” (McHale, col. 20, lines 24-26). There is no necessity for the data from each of the N subscriber lines to be synchronized in this process because each of the demodulators 644 receives data that originates from only one of the subscriber lines and which is directed to an xDSL modem that has been assigned by the controller to that subscriber. Further discussion of McHale is provided below with respect to rejections of individual claims.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 7, 38, and 44

Claims 7, 38, and 44 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,781,617 to McHale et al. (“McHale”) in view of U.S. Patent No. 5,822,368 to Wang (“Wang”).

McHale teaches “[a] communication server (58) [that] includes a plurality of pairs of frequency agile modulators (638) and demodulators (640) each set to operate at a unique frequency and associated with a twisted pair data line (54).” (McHale, abstract). As shown in Figure 1 of McHale, McHale teaches

a communication system 10 that provides both telephone and data service to a subscriber 12. A central office 14 is coupled to subscriber 12 using subscriber line 16. In operation, central office 14 provides telephone and data service to subscriber 12 using subscriber line 16. Subscriber line 16 supports simultaneous telephone and data service using twisted pair wiring.

(McHale, col. 4, lines 40-46). In addition, “[c]ommunication system 10 includes numerous other twisted pair subscriber lines 16 coupled to other subscribers 12.” (McHale, col. 5, lines 22-24). As further shown in Figure 1, “[c]entral office 14 includes a splitter 50 coupled to subscriber line 16 . . . [that] . . . divides subscriber line 16 into a twisted pair phone line 52 and a twisted pair data line 54.” (McHale, col. 5, lines 50-54). Therefore, each of the data lines 54 corresponds to a single subscriber line. Further, “communication server 58 is coupled to splitter 50 using data line 54.” (McHale, col. 5, lines 64-65). Additionally, “[c]ommunications server 58 multiplexes modem digital outputs into a multiplexed digital line 62 for delivery to a router or other network device 60.” (McHale, col. 6, lines 26-28). Figure 13A, which is cited by the Examiner as teaching certain elements of claim 7, “illustrates in more detail a frequency multiplexing

implementation for switching modem connections in communications server 58.” (McHale, col. 19, lines 64-66). In particular,

[a]s shown, data lines 54 are coupled to receiver/buffers 630 and transmit/buffers 632. . . . For each data line 54, communications server 58 includes a frequency agile modulator 638 and a frequency agile demodulator 640. Each modulator 638 operates to modulate an incoming analog signal at a selectable frequency. In the illustrated embodiment, the frequency is set to one of a plurality of frequencies, f1 to fN, equal in number to the number of available modems. Similarly, each demodulator 640 operates to demodulate at a selectable frequency where the frequency is set to one of the plurality of frequencies, f1 to fN. Associated modulators 638 and demodulators 640 are set to operate at the same frequency.

(McHale, col. 20, lines 2-16). Therefore, McHale teaches that the analog data signals from each subscriber is modulated by one of the frequencies and transmitted to a matched demodulator. As discussed above, there is no need for, and no teaching that, the digital data between subscriber lines be synchronized.

McHale’s teaching of a system where signals from each subscriber are independently transmitted to one of several digital modems by modulating the signal from each subscriber by a different frequency, is very different from the invention claimed in claims 7 and 38. In particular, McHale does not teach or suggest a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7, or “a plurality of bits having been synchronously encoded and transmitted across the plurality of transmission bands . . . wherein the plurality of bits synchronously transmitted across the plurality of transmission bands of the serial/deserializer system is recovered,” as is recited in claim 38.

Wang does not cure the defects in the teachings of McHale. Instead, Wang teaches “[a] digital audio broadcasting (DAB) system [that] includes a radio-frequency (RF) receiver that develops a characterization signal representative of a respective mobile communications channel as a precursor to estimating a channel impulse response.” (Wang, abstract). As shown in Figure 1 of Wang, for example, only a single analog audio input is utilized. Wang, therefore, does not teach a serializer/deserializer transmission system as is recited in Applicants’ independent claims 7 and 38.

Therefore, claims 7 and 38 are allowable over the combination of McHale and Wang. Claim 44, which depends from claim 38, is allowable over the combination of McHale and Wang for at least the same reasons as is claim 38.

Claims 8-9, and 15-17

The Examiner rejected claims 8-9 and 15-17 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang and further in view of U.S. Patent No. 6,163,563 (“Baker”). As discussed above, claim 7 is allowable over the combination of McHale and Wang. Baker does not cure the defects in the teachings of McHale and Wang. Baker, instead, teaches “a technique useful in a receiver for correlating a generated, known sequence with received signal samples to determine the received signal samples in a multi-chip data sequence.” (Baker, col. 1, lines 8-11). Baker does not teach a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7.

Therefore, claim 7 is allowable over the combination of McHale, Wang, and Baker.

Claims 8-9 and 15-17 depend from claim 7 and are therefore allowable over the combination of McHale, Wang, and Baker for at least the same reasons as is claim 7.

Claims 11-14

The Examiner rejected claims 11-14 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang as applied to claim 9, and further in view of U.S. Patent No. 5,844,950 (“Aono”). As discussed above, claim 7 is allowable over the combination of McHale and Wang. Aono does not cure the defects in the teachings of McHale and Wang. Aono teaches “[a] cross polarization interference canceler [that] includes a digital conversion circuit for subjecting a demodulated signal of one channel to an analog-to-digital conversion out of two channels which are independently formed using carriers having the same frequency but having planes of polarization which are mutually orthogonal.” (Aono, abstract). Therefore, Aono also does not teach a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7.

Therefore, claim 7 is allowable over the combination of McHale, Wang, and Aono.

Claims 11-14 depend from claim 7 and are therefore allowable for at least the same reasons as is claim 7.

Claim 23

The Examiner rejected claim 23 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang as applied to claim 8, and further in view of U.S. Patent No. 4,599,732

(“LeFever”). As discussed above, claim 8 is allowable over the combination of McHale and Wang. LeFever does not cure the defects in the teachings of McHale and Wang. LeFever teaches “[a] signal processing scheme through which the receiver may, at any time, synchronize or resynchronize itself to the transmitted data signals that are received over a dynamic dispersive channel.” (LeFever, abstract). LeFever does not teach a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7, from which claim 8 depends.

Therefore, claim 8 is allowable over the combination of McHale, Wang, and LeFever. Claim 23, which depends from claim 8, is allowable over the combination of McHale, Wang, and LeFever for at least the same reasons as is claim 8.

Claim 24

The Examiner rejected claim 24 under 35 U.S.C. § 103(a) as being unpatentable over McHale in combination with Wang in view of LeFever as applied to claim 23, and further in view of U.S. Patent No. 6,351,677 B1 (“Leyonhjelm”). As discussed above, claim 23 is allowable over the combination of McHale, Wang, and LeFever. Leyonhjelm does not cure the defects in the teachings of McHale, Wang, and LeFever. Instead, Leyonhjelm teaches “a Cartesian control means (16) comprising a phase rotator (50) and a phase adjuster (52).” (Leyonhjelm, abstract). Leyonhjelm does not teach a “serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system,” as is recited in claim 7, from which claim 23 depends.

Therefore, claim 23 is allowable over the combination of McHale, Wang, LeFever, and Leyonhjelm. Claim 24, which depends from claim 23, is allowable for at least the same reasons as is claim 23.

Claims 25 and 28-29

The Examiner rejected claims 25 and 28-29 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang as applied to claim 8, and further in view of U.S. Patent No. 6,121,828 ("Sasaki"). As discussed above, claim 8 is allowable over the combination of McHale and Wang. Sasaki does not cure the defects in the teachings of McHale and Wang. Sasaki teaches "a demodulator . . . which keeps an average power of an IF input signal constant by means of an analog AGC circuit and compensates an error in the IF input signal by means of a digital AGC circuit situated after an equalizer so that an output signal of the demodulator is represented by regular signal points corresponding to the optimum BER (bit error rate) characteristic." (Sasaki, col. 1, lines 4-11). Sasaki does not teach a "serial/deserializer transmission system . . . wherein the plurality of demodulators recover a plurality of bits synchronously distributed across the plurality of transmission bands in the serial/deserializer transmission system," as is recited in claim 7, from which claim 8 depends.

Therefore, claim 8 is allowable over the combination of McHale, Wang, and Sasaki. Claims 25 and 28-29 depend from claim 8 and are allowable over the combination of McHale, Wang, and Sasaki for at least the same reasons as is claim 8.

Claims 32-37

The Examiner rejected claims 32-37 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, and further in view of U.S. Patent No. 6,351,293 B1 (“Perlow”). As discussed above, claim 7 is allowable over the combination of McHale and Wang. Perlow does not cure the defects in the teachings of McHale and Wang. Perlow teaches “[a] decision directed phase detector that uses the quantized data output from a slicer to aid the phase error detection process to determine a phase error of a complex signal such as a vestigial sideband (VSB) signal containing in phase (I) and quadrature phase (Q) components (I and Q signals).” (Perlow, abstract). Perlow does not teach a “serializer/deserializer transmission system” as in claim 7.

Therefore, claim 7 is allowable over the combination of McHale, Wang, and Perlow. Claims 32-37 depend from claim 7 and are therefore allowable for at least the same reasons as is claim 7.

Claims 39 and 41-43

The Examiner rejected claims 39 and 41-43 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang, and further in view of U.S. Patent No. 5,715,280 (“Sandberg et al.”). As discussed above, independent claim 38 is allowable over the combination of McHale and Wang. Sandberg does not cure the defects in the teachings of McHale and Wang. Sandberg teaches “an improved method for transmitting or receiving subsets of data for use in” multicarrier transmission systems. (Sandberg, col. 1, lines 6-9). Sandberg, however, does not teach a serial/deserializer system where “a plurality of bits having been encoded and transmitted across the plurality of transmission bands . . . wherein the plurality of

bits synchronously transmitted across the plurality of transmission bands of the serial/deserializer system is recovered,” as is recited in claim 38.

Therefore, claim 38 is allowable over the combination of McHale, Wang, and Sandberg. Claims 39 and 41-43 depend from claim 38 and are therefore allowable for at least the same reasons as is claim 38.

Claim 45

The Examiner rejected claim 45 under 35 U.S.C. § 103(a) as being unpatentable over McHale in view of Wang. As discussed above with respect to claims 7 and 38, the combination of McHale and Wang does not teach “a receiver system in a serial/deserializer system . . . wherein a plurality of bits that were synchronously transmitted across the plurality of transmission bands is recovered,” as is recited in claim 45. Claim 45, therefore, is allowable over the combination of McHale and Wang.

Allowable Subject Matter

The Examiner objected to claims 10, 18-22, 26-27, and 31 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 10, 18-22, 26-27, and 31 all depend from claim 7, which as indicated above is allowable over the cited art. Therefore, Applicant has not amended claims 10, 18-22, 26-27, and 31 in this amendment.

Conclusion

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

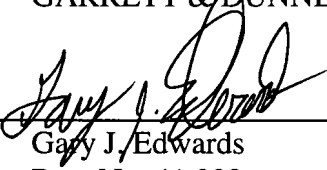
Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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